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FORMERLY

AMERICAN GAS LIGHT JOURNAL

VOL. CXI., No. 23
WHOLE No. 3222

NEW YORK, SATURDAY, DECEMBER 6, 1919

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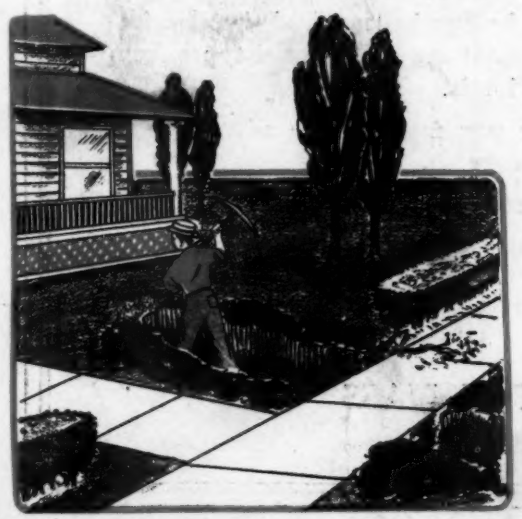

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Home Centres Around the Fireside

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Equalizing the Cost of Service by Reorganization of the Distributing System

How the Consumer in the Outlying District Who Is Served at a Loss May Be Turned Into a Source of Profit

By L. W. ALWYN-SCHMIDT

New York Economic Service Bureau

It is a generally recognized principle of all gas distribution that the price of gas should be approximately the same to all consumers in a given territory.

In theory this principle assumes that it should cost the same to sell gas one mile away from the plant or at a spot five or more miles removed. In practice, of course, this is an entire impossibility. The cost of distribution varies with the distance of the consumer from the producing point. But it is no good arguing to the contrary. The principle having been established once in the interest of so-called rate making it is just as well to accept it as a foregone conclusion.

It will not be changed again in the near future and the gas enterprises will have to adjust themselves to it as they have done in the past.

Average rate making means the establishment of a rate that will take care as much of the production and delivery cost to the farthest removed point as it will to points in the immediate neighborhood of the point of production.

It is only too obvious that the actual average cost will change with every reduction or extension of the distribution net. In making average rates, public service commissions, therefore, have as a rule given some latitude to the gas plants to adjust their rates to circumstances.

But the rapid extension of many cities during the last years has generally worked to the disadvantage of the gas enterprises which find themselves heavily handicapped by the system of the cut rate.

No Doubt of System's Being Wrong Commercially

The question arises: How much is the system to blame for the present situation of the gas industry, and how much of the blame has to be attributed to the gas industry itself.

No doubt commercially the system is wrong from many points, but it has also certain undeniable advantages in preference to all others, that make it sufficiently valuable for producer and consumer as to make desirable its continuation even in the face of its severe defects.

The gas industry has known these defects from the beginning and it is, therefore, up to the individual gas plant to eliminate them as much as possible. If the mountain declines to come to Mohammed, it is due to Mohammed to approach the mountain. The day of the meeting will be hurried the earlier Mohammed makes up his mind to move.

That Loss from the Outlying District

Every gas works has to serve certain outlying districts, which, while productive of income by itself, cannot be made paying owing to the high cost of the main line that has to be carried in their direction.

A typical example may suffice.

Here is a certain city of 14,000 inhabitants in one of our Eastern States. It is one of the older communities that has developed rather slowly and consists now of a solid mass of street and houses containing all the principal buildings and factories with roads leading out in several directions. Along these roads houses are situated and at convenient spots small settlements with side streets have developed which show here and there quite a sprinkling of factories.

The railroad encircles this city in its northwestern

section and the gas plant is very conveniently placed at the southeast boundary next to the station, with sidings connecting the yard with the railroad.

To reach the business center of the city a number of mains have been used which are sufficient to take care of all the consumption in the principal streets and have done so for quite a number of years, in fact since the building of the gas works.

In the meantime, however, the city has grown.

It has expanded not only along the roads mentioned before, but there has been quite a strong industrial development in the northwestern section of the city, where factories have been built that have also become gas consumers.

Trouble arose first about the supply of gas to these factories and the surrounding private houses.

In the early days of the enterprise a smaller line had been driven out along the main road in question which had been sufficient to light the few houses and the street. But the factories are large consumers and the increase in the use of gas for kitchen purposes has also added enormously to the pressure in this direction.

The result was that the pipe arrangement was no longer sufficient.

Also there was the difficulty of the new industrial development being situated in the district outside the circle of profitable distribution, and that every increase in the consumption at this point meant a distinct loss to the gas plant.

Condition Similar in Many American Cities

This is a situation which repeats itself to-day in many of our American cities. The war and the growing industrial activity has brought much prosperity to our industrial communities, but the gas works watch this development with growing concern.

If it continues, it may easily mean destruction to many gas enterprises, although all of them appear to sell more than ever before.

The reason is in every instance the increase in sales, outside the profitable radius of the plant without the gas plant finding a compensation by a similar development of its business in points more favorable to service at a profit obviously is a case of burning the candle at both ends. The gas works are in the position of a business man who keeps up his turnover by continually running sales at cut prices. They earn much money, but there is no profit to their sales, and they must break down one day under the load of their feverish, but ruinous activity.

Several Solutions for the Problem

There are a number of ways by which a solution may be found for this particular problem. All gas companies should, on the face of it, in their own interest follow the principle of not encouraging too much business in districts, where it is not wanted in relation to the distribution cost of the company.

This may not be a clear-cut policy, but the fact can easily be traced by studying carefully the sales development of a number of gas enterprises in different cities. If such a development takes place, nevertheless, against their will, their first inclination will be to bring about a balance of the distribution by raising the consumption of gas in such districts where they can expect a good return to recompense the enterprise for the loss in the other direction. This may be done by a house-to-house campaign in the desired districts in order to bring about a larger domestic consumption at well paying rates. It may also be done with the aid of the municipality which is vitally interested in this matter of rate upkeep, by the development of new streets and the building of highways to localities where the gas company can expect to sell profitably.

If this plan succeeds it will be possible to raise the sales turnover inside the paying radius to such an extent as to eliminate the disorganizing effect of the development in the not paying radius. The average rate will be retained and the profit of the enterprise can be maintained notwithstanding the loss occurring from the increase of sales in the not paying district.

This means of readjustment has proven of only limited avail in the smaller communities.

Smaller cities do not respond very easily to such a lead and the private consumers are soon filled to capacity.

So other and more effective methods are required.

There are two difficulties to meet in this instance.

The first is technical, resulting from the insufficient capacity of the main pipes in the case of the development of a heavy load upon one main line.

The other is the financial one already discussed.

The first difficulty may be eliminated by increasing the capacity of the main or by sending a second main in the required direction.

But it may then be found that the solution itself increases the financial problem.

To run an expensive main line through a district which does not contain many paying consumers, at least along part of the road with a heavy but insufficient load on the end, is always a very expensive matter.

In the case under discussion the question arose what to do with the surplus capacity of the additional main accommodation along the line after it had left the city proper.

The private houses were well served already with all the gas they required and the new load formed an addition much above the actual requirements of the earlier section of that district.

The gas works in this case decided for a rather bold course which was to solve the technical and financial problem at the same time.

Instead of carrying the new load along a large main line to the point where it was wanted, it was decided to break up the supply in two distinct lines, reaching the point in question by two different ways and having two endings at various strategical points in the new district.

Taking the Bold Course

It was argued with some correctness that after the development had once taken place it might as well be encouraged to a point where it would become a paying proposition for the gas company.

The development had taken place in a westerly direction, which is always favorable for further developments as most cities show a tendency to develop to the west.

To have one main line out in this district along a

sparsely populated road that might be filled up in time, but at the present moment offered little encouragement, was a risky enterprise anyhow and would cost nearly the same as a double line.

On the other hand the second line might be carried sufficiently removed from the older line as to encourage a new development somewhat south from the old road.

This would broaden the market for the gas plant and including side lines might easily bring sufficient additional business as to make worth while the carrying of the surplus load at a loss for a number of years.

It was also thought possible in this case to find the assistance of the property owners who naturally would welcome the carrying of a pipe line along their boundaries.

In the case under consideration it was not necessary to drive an entirely new line from the gas plant to the point in question, but one of the other main pipes was selected which led through a less busy district of the city with an outlet in western direction.

This was carried in an energetic curve northward and finally connected with the outlying point at a spot somewhat further out as the end of the present secondary line.

Also the old line was strengthened so as to give all the support for coming growth along the old road.

It is now expected that a third line may be necessary still further south of the second line.

Considering the sparse development of the district west of the heart of the city in this case there appeared no need for a complete reorganization of the whole gas supply of the city. Let us assume, however, that the development would proceed at a quicker rate and that new factories and houses will come to that district.

The population center of the city will then move westward and with it will follow not only the business district, but the railroad station and finally the gas plant.

Any such development, in fact, would bring the enterprise so hopelessly out of the radius of profitable distribution that no management and no ingenuity would save it from destruction.

The Radius of Profit

What constitutes the radius of profit in the case of a gas plant?

The answer is not easily given.

It may, however, be defined as the point of the line where gas can still be sold with a profit to the distributor at the rate established under the contract of the gas plant with the municipality.

This point naturally is not the same in every direction.

It will be further removed from the central plant in the case of a much occupied main, and it may be very near in the case of a little populated road with few consumers.

It is assumed in theory that the radius of profit should cover at least three-quarters of the city limits proper.

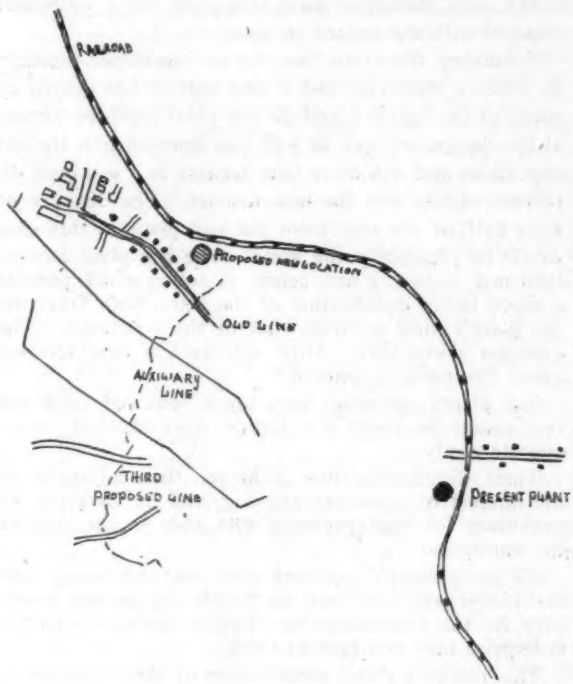
Outside that line follows a region where gas can still be sold upon the strength of profits made in the sales in the proximity of the gas plant.

This region slowly goes over into that, where the gas plant becomes the loser. It is very important that the third region should not become too large.

Should Know Its Profit Boundaries

In the interest of proper management it is advisable that every gas plant should know from year to year the approximate boundary of each of the three regions.

This boundary should be established by a careful analysis of the sales expenses and the takings along each main line and a sort of a danger zone should be



established in this manner that may be used as a call for caution.

From year to year track will be had in this way of the development of the business of the gas plant.

It will be easily seen, whether more new business comes from the districts of strict or only qualified profitability, or whether it begins to develop more rapidly outside that circle.

The latter event is to come one day in the history of nearly every gas plant.

Very few communities develop in a perfectly circular manner, grouping itself in even distance around the original spot of settlement.

It is to the positive advantage of the enterprise that the dangerous development be recognized early enough so as to arrange for a reorganization of the enterprise upon the basis of the new situation.

This psychological moment will also come in the case of our example. The gas plant then will have to be moved bodily to a spot where it has a better chance to prosper than on its present. The ideal spot would be in the north of the city where the railroad touches first

the city limits proper which also may become the place for the new railroad station.

Bringing the Gas Plant to the Consumer

This article is not written with a view to assist in the selection of a new location for the gas plant, but rather to discuss the financial and technical effects of such a change.

We may, therefore, leave this point for a while and proceed with the matter on hand.

Assuming, therefore, the city has developed strongly in western direction, and a new section has grown up south of the railroad, and the gas plant has been located at the designated spot, it will then connect first the old city mains and will drive new feeders in a southern direction cutting into the new district. The distance of each half of the city from the gas plant in this case would be practically the same. The gas plant has established, in fact, a new center of action which permits a much better equalization of the rates, both from the gas plant's view as from that of the consumer. The question arises then: How can such a new location affect the rates in general?

Gas plants operating very much removed from the real center of their distribution field naturally must operate costly.

Their distribution line is longer than advisable in the interest of economic working, and the necessity of providing for high pressure also adds to the cost of the enterprise.

No gas company can work very long at a losing rate, and if this point has been reached it will become necessary for the community to raise the rates, so that the enterprise may continue to exist.

This means a direct penalization of the consumer in proximity of the plant in favor of the far-removed consumer, who is responsible for the raise.

On the other hand, to bring the gas plant to the center of its distribution field and remove the necessity of long and unprofitable high pressure lines immediately cuts the distance in every direction. It rounds off the system and makes possible the most economic operation of the plant.

It depends entirely from the cost of the removal and the increase in business, whether the company will be able in such an instance to reduce also the cost of the gas to the consumer.

There is a fourth possibility left, which may recommend itself in some cases, that of erecting a second smaller producing plant, at a spot more convenient than the principal plant, and to connect it with the districts where the additional service is required. This is a matter entirely for the consideration of the engineers and the financial experts of the enterprise. It may, however, turn out cheaper in the end than the removal of the whole plant, especially if there are reasons that may lead to expect a further growth of the city in a region easily reached and profitable to the main plant. The advantages in this respect lie principally in the comparatively low cost of running a smaller plant and in the facility it offers for convenient location. It should be considered in every instance where the removal of the plant is taken under discussion.

What Other Nations Expect Our Coal Mines to Furnish

One of the outstanding problems of Europe to-day is the enormous shortage of coal. Europe will mine at least 60,000,000 tons less than she needs. The coal which is wanted is practically all bituminous coal and is needed to run the European railways, develop power for the manufacturing plants, and heat their homes. Our allies in the war are the chief sufferers for want of coal, particularly Italy and France.

The bituminous mines of America this year, up to the date of the strike, had produced approximately 100,000,000 tons less coal than during the same period last year. Thus, at a time of great European need for coal, America has had abundant mining capacity available to supply those needs if the coal could be shipped to Europe. The mutual advantage of such a movement is perfectly plain, but to accomplish this helpful result, problems of credit, of rail transportation, pier and harbor facilities in the United States, and ocean shipping are all involved.

At the conference in Atlantic City leaders of the bituminous coal industry of the United States met with delegates from Italy, France and Belgium to discuss these problems and to take practical action for their solution. The results of the conference are indicated in the American committee's report, which is as follows:

"The French delegation stated that the total requirements of France would be about 88 million tons per year. During the present winter it seems unlikely that Germany will be able to deliver the coal to France stipulated by the peace treaty. Allowing, however, for the imports that can be obtained from Germany, Belgium and England, more than 22 million tons of coal are now required from the United States. For some years to come several million tons must be imported from America. Members of the French delegation expressed the belief that control of imports and distribution of coal in France by the French Government would be continued for perhaps six months; thereafter it was expected that the business would return to private hands. The committee emphasized the high price of American coal delivered in France, due to high ocean freights. They also spoke of the difficulty of obtaining sufficient vessel tonnage to transport coal.

"The Italian delegation dwelt on the importance of developing a permanent coal trade between the United States and Italy, and said that Italy would necessarily now look to this nation for several million tons annually. They also pointed out the excessive cost to Italy of present imports of American coal with ocean freight so high and with exchange rates so unfavorable to Italy.

Italy Doing All She Can

"Speaking of the scarcity of shipping to transport to Italy, the delegates explained that Italy is using some of her own ships and is chartering other ships to carry her coal imports, and is thus helping to bear the burden of transportating coal across the ocean.

"The conference with the Belgian representatives developed the fact that Belgium is now producing nearly 90 per cent of her pre-war coal production. Her chief needs are for coking and other special coals, but with the present prices of American coal so high when delivered in Belgium, on account of ocean freights, no important purchases of coal by Belgium in this market are to be expected.

"Your committee explained the nature of American coals and the different kinds which are available for export and for use abroad. It mentioned the probability of a strike of bituminous coal miners on Nov. 1. Your committee felt it necessary to warn European purchasers against the activities of irresponsible speculators in the export coal trade, many of whom have never had any connection with the coal business, and have no expectation of continuing in it, and are offering to sell coals which they cannot obtain and deliver. It explained that the tidewater coal pools, conducted by the United States Railroad Administration, prevent the delivery of coal of stipulated character on export contracts when the coal is handled through these pools. This statement developed the fact that European buyers are opposed to accepting pool coal and do so only because they may not be able to obtain what they require outside the pools.

"Credits and financial arrangements were mentioned, but were left to the Committee on Credit and Finance, with the assurance that American coal exporters would do their full part in carrying out any recommendations of the Committee on Credit and Finance.

"The conference developed the unanimous opinion that there is no European demand for anthracite, but that the need is for bituminous coal. It was made clear that, barring a strike, America can produce ample bituminous coal of the qualities and kinds sufficient to supply the needs of our allies in Europe, but that scarcity of ocean shipping and high ocean freight rates are preventing the shipment of the coal required. The further fact was brought out that if our overseas coal trade is to be much expanded, better facilities must be provided for export shipments at American coal ports and for discharge at European ports.

"The conferences also developed unanimity of sentiment that the task of supplying our allies with sufficient coal can best be handled through the normal activities of the business men of the nations involved, free from restrictions or interference by their governments.

Determination for the Future

"In conclusion, your committee desires to express its appreciation of the great and progressive work done by the United States Chamber of Commerce, and pledges itself and the coal industry to use every possible effort to bring to a successful outcome the deliberations of the conference. We also wish to express to the members of the visiting delegations our thanks for the clear and lucid manner in which they brought the necessities of their respective nations before us and the helpful suggestions they made."

Luminous Paint

Meso-Thorium, a radop-active element identified by Hahn in 1905, has recently become a regular by-product in the American manufacturer of incandescent gas mantles from monazite sand. It represents a former waste that is now being carefully recovered; but it is not a cheaply obtained material, its cost so far having been 40 to 60 per cent of that of radium. Its use is suggested as a substitute for radium, the latter being saved for medical purposes. It is especially adapted for luminous paint for articles required for only comparatively short service, but while half of radium decays in 1,600 years, the useful half of the life of meso-thorium is only five or six years.

Colloidal Fuel, the New and Important Fuel Developed by Lindon W. Bates

A Fuel that Can Be Sealed Against Combustion—Has Greater Heat Unit Rate than Fuel Oil—Is Handled as Easy as Fuel Oil—Leaves Almost No Ash—Burns Smokelessly, but Can Be Made to Throw Off Smoke Screens

American experimenters have developed a fuel mixture known as *colloidal fuel*, which is expected to halve the fuel dearth of the earth, give industry an added stature and the grasp of commerce longer reach.

Colloidal fuel will bring the veins of coal in England that are too lean for use alone; the lean lignite veins in Italy, and those throughout the world that are of too low grade for furnaces into usefulness and make them add fabulously to the energy of the world.

It will make possible a conservation of practically 50 per cent of oil as now consumed, for it can be made with coal tars and coal tar residuals and, in its various forms, still fluid, can increase by 100 per cent the world's supply of fuel in liquid form. Crude oil, coke and even peat can be incorporated successfully in the mixture.

The credit for such a unique fuel rests with the Submarine Defense Association, a private organization which co-operated with the United States Navy and the British Admiralty in scientific anti-U-boat warfare, using a United States naval vessel for experiments. The head of the Association's Engineering Committee, Lindon W. Bates, took to himself the development of a fuel of a certain new and important nature. He enlisted for its trials experts from some of the largest corporations in the country. Among them were men from the Eastman Kodak Company, the West Virginia Paper & Pulp Company, the New York Edison Company, the Interborough Rapid Transit Company, the Fuller Engineering Company, the Nichols Copper Company, the American Smelting & Refining Company and the Baltimore Copper Smelting & Rolling Company.

Mr. Bates is an expert on the oil fields of the world and on the nature of fuel oil, and he knows coal, also, as few engineers. Once entrusted with the work by the Submarine Defense Association, experiments under his direction that counted hundreds began, progressed and, in the end, produced the sought for and successful colloidal fuel.

Investigators who before the war had attempted the same thing failed. They failed for the one simple reason that keeps lemon seeds at the bottom of a lemonade glass or that sinks pebbles in a puddle—that of gravity. Coal in any form had never successfully been suspended in a fluid substance. The Bates experimenters first pulverized coal to nearly molecular fineness. By diligent effort they perfected a suspending ingredient—a *fixateur*—that thwarts gravity, keeping the coal particles held where placed in the new mixture. The nature and the content of the *fixateur* are secret.

The progress and success of the Bates experiments are well wrapped up and more or less definitely told in this one fact of the *fixateur*. Once it was obtained and its action affirmed, development of colloidal fuel was comparatively simple. The story of its method of achievement is fascinating chiefly to engineers—the significance of what the fuel may accomplish has a potential interest for every business man.

In colloidal liquid and solid fuel have been combined

in a new whole. It is a mixture of coal and fuel oil. Colloidal fuel was made possible by the suspending in the oil of pulverized coal atoms.

Liquid in form, as it may be, it also may be a jelly substance or a thick and unctuous paste. It is represented, in fact, through a whole new series of fuels. One of the series is free-flowing, with 69 per cent of oil and 30 per cent of powdered coal, the enabling *fixateur* in any case being not more than 1 per cent. Another of the series is approximately 40 per cent coal, 59 per cent oil. Another is almost three-quarters coal. Each will move with pressure through pipes, and will atomize readily; and any furnace equipment that provides for oil can be used, without alteration, for colloidal fuel. Once mixed the solid particles remain suspended for months, and afterwards an occasional stirring is all that is required to give back to the fuel its original combustion properties.

It has the unique property, for a fuel that may be classed as liquid, of being heavier than water. Poured on water into a container, it sinks; water put on the top becomes a seal against combustion without affecting or entering into the composition of the mixture. So sealed and stored, on a ship or in a warehouse, danger from fire and from other accidents discounts itself. Left in the sun, it will not destroy itself by spontaneous combustion—as coal dumped out in the sun along tropic sidings will.

Nor, poured out upon the water by the ramming of a vessel or an explosion in one tank, will carry fire nor be the kindling of a fire, because, sinking, it halts disaster. Smokeless, by overfiring it can be made to throw off dense smoke screens, and, combustion finished, what inconsequential ash remains is grainy and as light as pumice.

It is fitted peculiarly for conservation in furnace work—in direct fired, reverberatory, regenerative and crucible furnaces, for brick kilns, for annealing, bolt heading, blacksmithing, brass melting, forging, rivet heading and open hearth furnaces fitted for oil, for quenching and tempering baths, for copper, brass and ceramic works—for the multitudinous furnaces of all industry.

Compact, it is less bulky than coal or oil. It is less expensive, according to the tests of Mr. Bates, for the heat and energy it gives than either coal or oil.

Before the armistice was signed the colloidal mixture had been tested out successfully at sea. Its individual developers have continued their experiments and tests since then, beyond the existence of the Submarine Defense Association, and have tried the fuel in plants upon land. Until recently, naturally, its tests have been observed and its performances attested principally by officials, but many of these are men of international scientific and business standing. Experts representing the French, British and Italian War Missions and Admiralties, Italian, Australian and Chilean railways, the United States Shipping Board, the Emergency Fleet Corporation, the American and British Shipping Control, the Naval Consulting Board, and many steamer lines and oil, coal and boiler companies have all witnessed performance tests. To-day the fuel is entirely ready for commercial use.

The fuel has many unique properties and its already demonstrated effects upon the industrial abilities and resources of the world are important.

Great crucible furnaces and the driving engines of huge liners acquire a new combustion material. Cities' space problems, high rents, coal shortage in homes, all become potentially affected by a fuel less costly, bulky in its storage and made up of elements more plentiful either than coal alone or oil alone.

PUBLICATIONS

Report of Committee on Standardization of Petroleum Specifications

Prepared by the Department of the Interior, Bureau of Mines.

It contains the preliminary changes of gasoline specifications and revised specifications for motor gasoline, which became effective Nov. 25, 1919. It also contains a description of procedure and details of manipulation in conducting distillations, President Wilson's order for the purpose of better utilization of resources and industry in the interest of economy and more efficient concentration, and the names of the men on this committee and those who acted as technical advisers to the committee.

Coking of Illinois Coal in Koppers Type Oven

Authors, R. S. McBride, Engineer Chemist, *Bureau of Standards;* and W. A. Selvig, Assistant Chemist, *Bureau of Mines;* 51 pages; published by the Bureau of Standards, Washington, D. C. This is No. 137 of the Bureau's Techologic Papers.

The Bureau of Standards was ordered by the Administration to conduct an investigation of a new coke oven process suited to utilization of by-products. The test demonstrated that some Illinois coals can be coked in the Koppers Type Oven without radical change in operating methods for producing coke for use in blast furnaces. The yield of gas and by-products from the Illinois coal is proved excellent both in quantity and quality. The Bureau of Mines was responsible for the sampling and weighing including the handling of the coke, analyses of coal, etc. The subject of costs is not discussed in this report, since this depends upon local conditions.

This paper is now ready for distribution and anyone interested may obtain a copy by addressing a request to the Bureau of Standards, Washington, D. C.

Comparison of Public Utility and Industrial Financing

Although adverse conditions have affected public utilities arising from war prices and fixed rates and fares, these corporations have been able to do considerable financing recently by means of stock issues sold to the public. The total amount of stock sold by public utilities corporations so far in 1919 is $53,601,490. This compares with $614,858,600 preferred stock and $514,948,500 common stock sold by industrial corporations.

Thinks Two Cubic Feet of 300 B.t.u. Gas at Same Price as One Cubic Foot of 600 B.t.u. Gas to Advantage of Consumer

Henry L. Doherty Deals with Democracy in Gas Association, the Gas Companies Launching Out as Oxygen Producers, Thermal Standards, Rates and Rate Making, Motor Fuel and Other Topics All Within the Compass of One Paper

First of all we need a strong, representative and democratic association, declared Henry L. Doherty, in a paper presented at the recent annual convention of the American Gas Association. When I say strong, I mean that it should have an abundance of funds and should have the earnest co-operation of the industry; when I say it should be representative, I mean that it should have not only support by membership, but the benefit of the work of the men who are the best skilled and most active; and when I say that it should be democratic I mean that everybody connected with the industry should feel that they have an equal welcome to, and an equal voice in, the management of the association. When I say it should be representative I also mean particularly that the men who sit on the Board of Directors, also those who direct the activities of the association by doing section and committee work, should be representative in the sense that they are able to vote according to their own convictions and according to the information which is laid before them.

Freedom of Action

It is disheartening to serve on a board of directors or a committee where some of the members have had their instructions before they left their home office as to what they should vote for. Generally speaking, it is difficult to be free from a certain amount of restrictions by instructions from the home office unless the directors and others deciding the policies for the association are in every case the absolute heads of the organization they represent, and I think so far as possible we should endeavor to enlist the active heads of all of the different corporate entities in the gas business and keep them interested in our work.

The man representing the smallest gas company in the United States as the head of that company is often more free to cast an independent and intelligent vote than the man who is only one of many representatives of a large organization which has set policies of its own. I do not mean by this that in every case the work of the association must be carried out by the heads of these different companies, but we must have the work of the association carried on by men who are untrammeled by home instructions. It is maddening to try to do business with a fellow director or a fellow committeeman who must vote according to the instructions he received before he left his home company regardless of the arguments that are put before him. A rubber stamp or a phonograph would be equally helpful to our deliberations as a man who is forced to carry out instructions.

If the absolute head of our different member companies is unwilling to show sufficient interest in our association affairs by serving on our boards and committees and by attending our conventions, then we should make sure that the man the boss sends to us is untrammeled by home instructions or else look for other men to direct the association affairs.

Democracy Essential to Progress

None of the organizations that I am acquainted with is organized and conducted along lines as democratic as I would like to see. We all know the baneful influence of paternalism in our Government activities, and yet we are the first ones to adopt paternalistic methods in our association work. We generally have a board of directors that meets a few times each year and devotes only a few hours' time to the work, and yet we are tied hand and foot in everything we would like to do, except as we can get the consent of that board. Our past boards of directors seldom gave enough time to their work to be able to pass on any important matter that might come before them, and this led to restriction and a repression of proper association activities. Our present board of directors, I think, is the most representative board we have ever had, and it is a great pleasure for me to pay a tribute to the members of that board, for the frequency of their meetings and the earnestness of their work. This part of our association work we should maintain.

We should also prevent any men or group of men from usurping any particular function of the work that is being done, and dominating it to the point of restricting the active interest or enthusiasm of others. Instead of making it necessary to get the consent of the board of directors to create special sections, this matter should be mandatory, provided such sections are petitioned for by a good number of the company members. This idea of having a Technical Section, or a Commercial Section, or an Accounting Section, which assumes to dominate the entire field to the exclusion of what any other group of men wants to do, is, in my opinion, a mistake.

Any activity which can spring up beyond the membership of the association should be able to spring up automatically within the association. Some of the advertising men wanted to form a special section during the past year. This was opposed in some quarters. I am heartily of the opinion that an independent section of advertising men can do much more good than to simply have it as a part of the Commercial Section, and I am also satisfied that if the chemists wanted to form a separate section they would do vastly more and better work than if they were simply made a portion of the Technical Section.

In our association work we should endeavor to stim-

ulate an interest which will insure the best work and the best papers from the entire industry. We must continually keep in mind that the association should do that work which is of most importance to the industry and of most benefit to the public, and that it is not simply a technical society or a commercial society, and that it covers every feature of active interest both to the gas company and the public, such as relations with the public and public officials, finance and rational Governmental regulations, and to keep these regulations within the limits of necessity. Don't forget this, that we can't do everything and therefore we must always be sure to do that thing which is of most importance to the industry.

Standards of Gas Quality

Now as to the business itself. I look with great optimism on the future of the gas business, provided we can stimulate our own people to active work along rational lines. My optimism, however, depends entirely upon the people of the gas business realizing the changes that have taken place in our lives and methods since the time of Murdock. I am glad to pay a tribute to the wonderful men identified with the gas business in its early history, but I am quite sure that with the ability they showed at that time to adapt themselves to the conditions of their time they would show a greater ability to adapt themselves to the conditions of our time than we ourselves have shown.

We must have rational standards that fit our present time and not be tied down to the standards which were made in the days when gas was used only for lighting and used in open burners. Such gas as we do sell is now sold for a different purpose and under vastly different conditions. The future of the gas business depends upon substituting gas for solid fuel. We need men with the vision of prophets rather than men who simply know the history of the gas business. The standards under which we now work are absurd, unnecessary and a relic of a bygone day. I doubt if any gas company to-day sells more than 4 per cent of its gas for use in open flame burners, and it is ridiculous to enrich gas with hydro-carbons at great expense so that 40 ft. out of every thousand can be used in the most wasteful way to produce light.

The public itself would be benefited if we served a non-luminous gas, for this would force an economical method of using the gas on the part of the unthrifty. After having been a producer of gas for a great many years I am now a large producer of oil, and if I were to advocate what would best serve my business interests, I, of course, would advocate high B.t.u. standards and high candlepower standards just to insure a market for oil, but I hold that both are unnecessary and are generally a waste of good material. I will go further than this and say that I seriously doubt whether the ideal gas will contain any hydro-carbons whatever.

Here is a question that I would like to interest the gas fraternity in solving. What is the most desirable gas to serve from a customer's standpoint? There is absolutely no reason for fixing on a gas of approximately 600 B.t.u. per cu. ft. There is no elemental gas of such a relation between density and heating value. The only reason for such a standard is because by our present methods of carbonization a good quality of gas coal tends to produce a mixture of elemental gases having a value of approximately 600 B.t.u. The consumer is no better off with one cubic foot of a 600 B.t.u. gas than he would be with two cubic feet of a 300 B.t.u. gas, and, given a proper interest in the development of appliances, I am inclined to believe that far better results would be gotten from 300 B.t.u. gas.

Study Kinds of Gases

For some reason it always seemed revolutionary to gas men to talk about a gas containing no hydrocarbons. I know that in some of my work in trying to make progress in the gas business I spent a great deal of time and money on the possibility of producing on a commercial scale marsh gas from carbon monoxide and hydrogen. At the time I was working on this problem I became convinced that I could serve not only a cheaper gas but also a better gas when considered in the aspect of all of its uses if it contained no hydro-carbons; this, however, is a problem that I would like to see broadly considered and discussed. If we ever develop the gas business to a high degree of efficiency I am inclined to think that even with room heaters we will find that the greatest efficiency will be secured by the use of recuperators and that practically all of our industrial appliances will be equipped with either recuperators or regenerators. Hydrocarbons are objectionable on account of breaking down during the pre-heating process and either depositing carbon in the regenerators or elsewhere.

Properties of Marsh Gas

I am rather of the opinion at this stage of my investigation that the most satisfactory gas of that which we now have would be a blue water gas except for its large content of carbon monoxide. I am quite sure, however, that a gas running largely hydrogen gas would prove a very satisfactory gas and a much more satisfactory gas than the public now gets. There seems to be a universal belief that the quality of the gas is fixed by what I might term its B.t.u. density, or stating it in other words, that gas having the greatest number of B.t.u. per cubic foot is the best gas. This is far from true.

Marsh gas, having about 1,000 B.t.u. per cubic foot, has a much lower flame temperature than either hydrogen or carbon monoxide, although these gases run in the neighborhood of 300 B.t.u. per cubic foot. Marsh gas also has such a low rate of flame propagation that it cannot be used for some purposes. For instance, marsh gas cannot be used in a blowpipe. If we take 16 lbs. of marsh gas containing 4 lbs. of hydrogen and 12 lbs. of carbon, it would only produce in combustion about 90 per cent as many B.t.u. as if we were to burn 4 lbs. of hydrogen gas and 12 lbs. of solid carbon. The lesser amount of heat by the burning of the marsh gas is due to the heat required to dissociate the CH_4 molecule.

The only place where marsh gas is more desirable than, for instance, a blue water gas, is for use in an internal combustion engine where the Otto or some similar cycle is used, and the gas and air are mixed with each other during the compression stroke. Marsh gas permits of a very heavy compression, while the gas containing a large amount of hydrogen will prema-

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As the Journal Views It

The Outlook Ahead

Close students of the times are tending to optimism. We are settling down.

Strike after strike has been launched and has ended without that lax compromise without reason, and merely for the sake of peace that had characterized most of such contingencies that arose in the immediate past. Some industries are insuring themselves against interruption through just and iron-clad agreements between employer and employed.

The coal strike, a strike of vital import to the gas industry, is still in a very uncertain state, but there is reason to believe that when it is settled no principle of right or justice will be sacrificed in its settlement.

The jellyfish days, apparently, are a thing of the past. This in itself is progress of no mean import.

No intelligent person desires for labor anything that is less than just or anything that is not, as a matter of fact, generous.

But an inflexible stand against surrendering anything and everything just to temporize cannot but act as a damper on the success of those radicals among labor whose demands cease at nothing less than that which must by necessity be the ruin of all of us, capital and labor alike, if carried on to the breaking point.

The Recipient of All Blessings

Surely it is an ill wind that does not blow the gas industry some good.

The servant shortage has increased the trend toward the multi-family dwelling—buildings of the tenement or apartment house type. And in this type of habitation the gas company has almost a monopoly of all fuel demands above the basement.

It is the gas salesman's ideal hunting ground. The meter reader has his readings grouped in big clusters. The percentage of consumers per mile of main is at its maximum along streets lined by this class of habitations.

Whether or not apartment house life is beneficial to the dweller therein is a matter that is open to argument. From the viewpoint of prosperity to the gas company, other things being equal, there can be no doubt that a tendency of its consumers to so exist cannot be anything but beneficial.

Of course, we do not expect in this manner to reconcile the long-suffering gas man to the present disturbed conditions as to domestic help. An unqualified cheerfulness as to this state of affairs, we can very well imagine, might render us positively odious to a late-working superintendent, say, who must get up to cook the breakfast, while his more efficient helpmate gets the children ready for school.

How difficult it would be not to be an optimist in the gas field were it not that, however numerous the blessings that gravitate toward us, there are always those who strive to debar us from a profit under any combination of circumstances.

A Bugaboo Being Pushed Out of the Way

An obstacle that a very few years ago was an exceedingly important hindrance to the utilization of the by-product coke oven for the manufacture of city gas is being rapidly pushed out of the way.

When the market for coke was almost exclusively the metallurgical industries, the gas company that tied on too exclusively to the gas output of a by-product oven was taking a considerable chance.

When there is no demand for steel the steel industry does not need so much coke. But John Smith burns pretty much his usual quota of gas in his home fires year in and year out, regardless of activities in the metallurgical industries.

Naturally, when the by-product oven does not make so much coke it doesn't make so much gas.

But a considerable headway has been made to develop a market for coke that is as regular and as consistent as the market for city gas—that is, the domestic market. Develop it to its extreme possibilities and the most obvious present-day means of bringing down gas prices and affording the gas companies a greater flexibility in financing is at hand. Given a goodly portion of their produce that they can sell at as high a figure as the market will pay, and the slowness and stupidity—or worse—of some regulatory bodies will not be in so keen a sense a tragedy to them in periods of high prices as they sometimes have been.

Thinks Two Cu. Ft. of 300 B. t. u. Gas at Same Price as One Cu. Ft. of 600 B. t. u. Gas to Advantage of Consumer.

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turely ignite at heavy compression, and the secret of efficiency of gas engine work is to use heavy compression. The question of what is the best gas to serve to the public for the benefit of the public is well worth the attention of the gas business.

Rate for Gas

In the earlier days of the gas business we saw a number of attempts made to furnish fuel gas. In some instances these attempts were made by men who neither knew their chemistry, their physics nor their economics. No matter how efficient our gas making processes may become, and no matter how inexpensive the necessary manufacturing apparatus may become, it will never be possible to substitute gas generally for solid fuel and sell gas at a fixed price per thousand cubic feet. Some gas consumers would lose money for you at $10 per 1,000 cu. ft., while other gas consumers might yield you a handsome profit at 50 cents per 1,000 cu. ft.

Our expenses are not in proportion to the amount of gas consumed. Our expenses are fixed by the number of customers we serve and by the maximum rate of demand made by these customers. I have never seen the slightest reason to change from the opinions I have expressed in our old gas conventions regarding the correct method of selling gas. I think we must adopt the "readiness-to-serve" method and apply it universally to all consumers.

The interests I represent are proposing now to serve the customers on the line of the Kansas Natural Gas Company, the Wichita Natural Gas Company and the Quapaw Gas Company with gas at these rates for natural gas:

An annual customer's charge of $6 plus;

An annual demand charge of $0.32 per cu. ft. per hour plus;

A gas charge of $0.30 per 1,000 cu. ft.

The customer can contract for whatever demand he wishes to use, and is to be limited to this demand by an automatic device which we have developed. That is, if the customer pays for a 50-foot demand, his meter will be equipped with a demand regulator, and that will only permit 50 ft. to pass. For instance, under the new method of charging a customer using 150,000 ft. of gas for cooking and heating his home and requiring a demand of 100 cu. ft. per hour would pay:

Customer's charge	$ 6.00
Demand charge	32.00
Gas charge (150,000 ft. at 30 cents)	45.00
Total	$83.00

making an average cost of gas to him of 55.3 cents.

We propose to supplement natural with artificial gas as the natural gas fails, and we have agreed to sell this gas on a basis of:

An annual customer's charge of $6 plus;

An annual demand charge of $0.50 per cu. ft. plus;

A gas charge of $0.40 per 1,000 cu. ft.

In this case a cubic foot of gas shall be 1,000 B.t.u., or in the event that 500 B.t.u. gas is supplied, then the company will have to supply two cubic feet to count as one cubic foot.

To avoid the complication of talking cubic feet and thousands or millions of B.t.u. I suggest the adoption of 1,000 B.t.u. to be known as a "gas unit," and then we can use this term to express whatever quantities of gas of varying calorific value and mean the same thing. The price on the artificial gas in the proposition outlined above is based on coal at $3 per ton, and is to be advanced or lowered according to the cost of fuel.

A complete bibliography on the rate question will be found beginning on page 380, volume one, American Gas Institute Proceedings, 1906. Anybody wishing to look up my specific views on the rate question can get a paper I read before the National Electric Light Association in May, 1900, at the Chicago convention, entitled, "Equitable, Uniform and Competitive Rates," and for the reasons why it should be applied to the gas business they can also get a reprint of my testimony before the Kansas Public Utility Commission which was printed by the Commission and circulated among the interested parties in Kansas.

Natural Gas Shortage and Consequences

The ever-increasing demand for natural gas by the growth of the population is bringing about an extreme stringency, almost throughout the entire country, of the necessary natural gas supply. All of the natural gas companies will have to sooner or later supplement their natural gas supply with artificial gas or curtail their demand.

To curtail the demand for natural gas is not as easy a matter as it would at first seem to be. It has been demonstrated, and especially in Kansas City, that there is no practical method of curtailing the demand except by increasing the price. If gas is being sold solely on a per thousand cubic foot basis it would probably be impossible to curtail by price, so that the demand would be well within the supply, without bringing about such a heavy curtailment in consumption as to bring the demand far below the supply.

The demand for gas and the consumption of gas is not inversely proportional to the price, and demand and consumption are not synonymous and can vary greatly in their relationship to each other. In raising the price you cross critical points where gas no longer can compete economically with other fuels for certain uses. A rise in the price of natural gas beyond some of these critical points can work the seeming paradox of bringing into the company less gross and net earnings at a higher price than at a lower price. Each rise in price by curtailing some consumption automatically forces a still further rise in price, and it will probably be found that as the price of natural gas is advanced and the critical lines of competition are crossed the price of natural gas will have to go to a price to the consumer, approximating that of artificial gas.

Natural Gas Supplemented by Manufactured Gas

There is another reason why natural gas will have to be supplemented by artificial gas, and that is, because as the natural gas supply becomes diminished to a great degree and insufficient even for furnishing the gas needed for lighting and cooking, then the supply must be abandoned and artificial gas supplied for the complete demand, or else the natural gas supply must be supplemented with an artificial gas supply. In other words, I see no way to milk the last quantities of natural gas in the various fields from the ground except by supplementing the natural gas supply with an artificial gas supply.

It is to be regretted that when natural gas was introduced as a domestic fuel in this country that the foundation was not laid for a continued supply of fuel gas, of either natural or artificial gas. For instance, we know that customers will gladly pay as much as $1.50 to $2 per 1,000 cu. ft. for artificial gas for cooking. With gas at $1 per 1,000 cu. ft., they are willing to pay on an average, we will say, $25 a year. When natural gas is brought to a city as a substitute for artificial gas and sold, we will say, for 30 cents per 1,000, it is possible for the gas consumer to substitute 15,000 ft. of natural gas for the 25,000 cu. ft. of artificial gas he has been using, but instead of paying $25 for it, he pays $4.50, a price which is manifestly so small that it would not pay even for taking care of the accounts of the different customers.

Stimulation Through Price Adjustment

There are two fundamental natural laws which must fix the price of commodities and of service. The minimum price must always be in excess of the cost of furnishing the service, otherwise the service cannot be permanently furnished. The maximum cost must always be less than the value of the commodity or service to the user, otherwise the user will sooner or later substitute something else. While we could justify—as being for the best interest of the public—a different price for the use of gas for different purposes, yet it is not necessary for us to do this if we use a rational system of charging.

We can, however, measure the results that we might get if we were to say to a gas consumer: If you will agree to buy 25,000 ft. of gas at $1 per 1,000, we will then allow you to have an additional supply of gas for other purposes at 50 cents per 1,000. Such a rate would stimulate gas consumption far greater than to quote a uniform rate of a weighted intermediate value. By the stimulation of a greater consumption the unit cost for gas would be reduced, and the public as a whole would be served at a lower average rate.

The readiness-to-serve rate will accomplish this same result to still greater degree and can be entirely justified on the ground of expenses caused to the company and no distinction need be made in the purposes for which the gas is used. I am convinced that it is entirely possible to substitute gas very generally for solid fuel. Picture in your own mind the magnitude and prosperity of the gas business if this could be done and contrast

it with whatever future you see in your own mind for the gas business under present conditions.

This is not an idle dream, but even if it were the gas business would be immensely helped by dreaming some along these lines. To accomplish this we must be able to get out of our ruts and create our own reforms. It is a common saying that "nothing is ever reformed from the inside but reforms must come from the outside." There is much truth in this. I have tried for a number of years to work out several reforms in the public utility business. I have always found that my greatest opposition came from the men in the business.

In the gas business I have tried to get away from a standard of illumination and a fixed heating standard for a given unit of volume. Coal gas is now sent out to the mains containing hydro-carbons having considerable value for many other different purposes, and which to the gas consumer are of no more value than a like amount of non-luminous gas. In making carbureted water gas we must supply in our manufacturing process valuable hydro-carbons that are either not needed at all or else are not needed to the extent required by our present standards.

There was a time when my credit in this country was not as good with the men who then happened to control the destinies of the gas business as it was with many of the prominent gas men of England and Germany. It occurred to me that if I could get a reform in standards in England I could easily accomplish the matter here, because while America has led the world in almost every other line of endeavor we have in the gas business slavishly followed the traditions and developments of England and Germany. I recall nothing of an evolutionary or revolutionary character that we have done except the work of Lowe, whose reward was an overgenerous amount of criticism and very little in the way of appreciation.

While we have accepted as a standard the German and English results I cannot feel that their results have ever been within hailing distance of the results developed in this country in other lines of work. At the time of the threatened shortage of motor fuel and when France and England were offering huge rewards to anybody who would find a substitute for gasoline, I proposed to the motor industry of these countries that they advocate the removal of the light oils from town gas and use them as motor fuel. This was in 1911.

In 1913 at the request of people interested in the automobile industry I started a campaign in England which was intended to secure the necessary legislation to permit this to be done. At that time, if all the gas sold in Great Britain had been extracted for motor fuel, Great Britain would not have been compelled to import a single gallon of gasoline. I am very sure this campaign could have been successfully put over if it had not been for the opposition of the gas men themselves. I also showed how vehicles like buses with a fixed route could use town gas instead of gasoline by having stations along the route where gas could be charged to the vehicle under pressure.

My campaign was very favorably received almost everywhere except by the gas men themselves and the people they could stir up to oppose it, and must of the opposition took the form of ridicule and statements which were not true. War necessity demonstrated the possibilities and the correctness of the picture I then drew. I submitted a paper on this subject to the British Institution of Gas Engineering, but it was rejected.

If we are going to realize the possibilities that unquestionably do exist in the gas business we must overcome the intolerant opposition of the standpatter. I plead guilty to having said on more than one occasion that what the gas business needed most was a few first-class funerals. I am sorry I said that and I did not mean it that way. What I should have said was that the gas business would be immensely benefited if we could send a lot of our gas men who assume to speak for the industry off as Government ambassadors to foreign countries.

Some of the men I like the most in the gas business are, in my opinion, serious brakes on the wheels of progress. They oppose any change for fear a willingness to make changes might subject us to changes proposed by impractical reformers, and they are partially justified in this. No man having property which the courts can seize for any damage he does will willingly go into partnership with a bull in trying to catch a mouse in a china shop. But changes and reforms are necessary, and we certainly never can have them unless we are willing to at least talk them over among ourselves.

We must be prepared to again review the present needs and demands for gas and to throw away if necessary even appliances such as the bunsen burner, which perhaps no man in this room has ever looked upon as anything but a great benefit to the gas business, and yet I am not sure but what if the bunsen burner had not been used the gas business might not have been better off. It is a haphazard way of mixing the gas and air and has in many instances limited our opportunities to substitute gas in competition with other fuels. If the Bunsen burner is to be used universally, as it is now, it is a very easy matter to demonstrate to the public that the lower the B.t.u. standard in the gas the better the results secured per million B.t.u.

When you stop to think that your gas is acting as the motive power for drawing in the air and mixing it with the gas, it is a very simple thing to see how this can be done more satisfactorily and more properly the larger the quantity of gas in relation to the air. In fact, the average gas man is ready now to swear that a lowering of the B.t.u. is actually beneficial to the gas customer.

This is one of the many places where you can see the tendency of gas people to be superficial in their conclusions. I think if any one of the men who really believes this will carefully adjust the burners for each kind of gas and do a given amount of work with it they will find that for all purposes where gas is used for low temperature work the results are just proportional to the B.t.u. furnished.

In my opinion there has never been a time when we could not have carried gas from a coal mine to a city more economically and reliably as a power proposition, together with its use as a fuel, than can be done with an electric transmission line, yet with all of the handicaps that the electrical engineers had, with the difficulties of making a reliable electric transmission system, we have done nothing of this sort, and the electrical men have made what seemed at first almost impossible in actual practical results, a very successful affair.

The trouble with the gas business has been that it is still suffering from its once world wide prosperity.

I do not feel that we have even availed ourselves of the discoveries made by others in physics, chemistry and economics.

Let us take another example of some of the possibilities in the gas business of which we might avail ourselves. Prior to the war automobile engines could be purchased at less than $2.50 per hp. While it is true that we have never found an automobile engine that will stand up over an extended period of use at full load, yet to have rebuilt that engine so it would stand continuous hard use would not have been such a very expensive matter.

The engines used for motor boats have to stand a long, hard usage at maximum load, and this would be true of the tractor. I think it entirely possible to assume that by working with the tractor industry we can have a standard gas engine for our lines having powers at least up to 100 hp. and at a cost very much less than $20 per hp. If we will stop trying to carry two-thirds of all of our customers at a loss and give to every customer his service according to the cost he occasions our company, the amount of business we could do with a rational system of charging and with a low price gas engine would be enormous.

I can see even a possibility of the existing gas companies putting in plants for the supply of oxygen and distributing it to the closely settled manufacturing districts. These things can more easily be done if they are first discussed at our gas conventions. This matter of supplying not only gas but the oxygen in a concentrated form to burn it may seem far-fetched to many of you, but if it were not for the unwarranted lengthening out of this paper I would show you what a large demand has sprung up for oxygen in the last few years and what an enormous margin there is between the cost of oxygen to the manufacturing plant and its cost to supply it in this way, and I would also like to make some figures to show you what a field of oxygen consumption would be if supplied at a low cost. This is only one of several legitimate extensions to the gas business which I can foresee.

A Standard Odor for Gas

We have done some work on the matter of finding some extremely odorous substance that we could add to our gas and which would burn to inodorous compounds. In event of success we felt it would be desirable to create a standard character of odor for gas and of a standard intensity. This work was soon given the name of Standard Stink and I think that common and perhaps somewhat offensive word is more in accord with the practical methods of the day. We found that the Bureau of Mines were making a study of "Stinks" for another purpose and we are now awaiting the results of their work.

A universal character of smell and of uniform intensity would, we think, be desirable for many reasons. Our smelling faculties require education. If you take natural gas to a city that has never had it before the people say at first that it has no odor, but they soon learn its odor and can detect it almost as quickly as they can detect artificial gas. If there was some very decided and universal odor for all inflammable gas it would be an improvement on the chance odors we now get.

Minimum Charge

There is one thing that I want to put across at this meeting: Some companies charge no minimum bill and our minimum bill is seldom more than 50 cents a month. Grasp if you can the absurdity of anybody expecting to get gas service for a whole year at a cost of $6. This is but a part of a single day's wage of a high price mechanic. How can we pay our own men good wages and still make both ends meet when we attempt to do that which is obviously impossible. No reasonable man or woman would expect us to do it, and yet so long as there are some in our midst who are unwilling to protest against it it makes it hard for the balance of us to get relief.

We are providing a service entirely aside from the exact amount of the gas we furnish. We are entitled to make a charge for providing that service in addition to the charge we make for the gas. Some of us are now carrying 66 2/3 per cent of all of our customers without profit and more than half of this number are carried at an actual loss. The other 33 1/3 per cent of our customers are either paying the losses on the others or our stockholders are standing the loss.

There is no justification for making 33 1/3 per cent of our customers pay us all the profits we are entitled to, and in addition to this make good the losses on other customers. Such a situation does not even carry the common garden variety of honesty and justice. You cannot even approach a reasonable degree of equity in your charges without adopting some form of a service charge. It is obvious that with the same return to the company gas can be sold at a lower rate per thousand feet for gas when a service charge is made than when no service charge is made. With a service charge to every customer and thereby a lower rate for gas than it would have to be under the present method of charging, a greater volume of business can be done and the public as a whole served at a lower cost.

If I possibly can, I want to get every man at this meeting to go back home with the determination to justify his right with his own public to make a service charge to every customer in addition to the charge for gas and determined to get such a charge. Those whom I cannot convert I will ask them to go home and make actual figures to show them what such a service charge would do for them and whether they could not then better serve the public and at a lower cost. It is unnecessary to have a service charge as much as $24 per year for the small customers, and yet if a man wants service at all such service should be worth at least $2 per month to him.

There is little justification and little justice in a minimum bill, and many look on it as discrimination against the small customer, while a service charge against all customers does not carry this same argument of discrimination. There can be no equity in charging A 50 cents for one month's service if A has used no gas, and yet charge B 50 cents who has had everything that A has had plus 500 cu. ft. of gas. A minimum charge just inherently will not harmonize with equity and justice.

What the gas business most needs, and at once, is some form of a service charge, and it will be much easier to get such a charge if every gas man will advocate it. I hope the day is gone when those of us who know we need and must have this charge are han-

dicapped by those who will quote Murdock, their father or grandfather, and say, "Well, if these men got along without it we can." Or say, "Well, the gas business has existed all of these years without a service charge and therefore it can't be right."

I lost my appetite many years ago for trying to be a pioneer in the gas business and felt that the day for the pioneer had either passed or had not yet arrived.

If I see any evidence of co-operation from this paper I am willing to reshape my views and do at least my share of the pioneer work toward putting the gas business on a new plane of greater magnitude and prosperity.

The By-Product Coke Oven Industry, Expanded Through War Needs Is Still Increasing

In a dissertation on chemistry in industry, Charles H. MacDowell, president of the Armour Fertilizer Works of Chicago, brings out the point, pertinent to the gas industry, that a typical example of the growth of the chemical industry is the coking of coal, and the recovery, purification and utilization of the by-products formed. Mr. MacDowell goes on to say that during the war the number of ovens more than doubled. The coke, gas and tar were consumed in iron and steel manufacture, and the need for steel was bitter. Specific portions of the increased tar recovered were essential for the preservation of timber for the new wharves and railroads necessitated by our troop and supply movements. The increased ammonia production could not meet even one of many demands—that of the fabrication of ammonium nitrate—the most widely used high explosive in the war. The benzol, toluol, xylol, naphthalene were all used in explosives manufacture, and the production was insufficient to meet requirements.

The need for materials of war has ceased. As in ages past, swords are again forged into plowshares. Chemical industry is finding new and profitable outlets for its production. Powder plants are wrecked and equipment distributed to perform homely tasks of dyestuffs, fertilizer, and chemical production. Our steel plants find peace requirements demanding their productive capacity, and the by-product coke-oven industry, expanded through war needs, is still increasing. The pig iron and steel require no less coke gas and tar for fabrication. Needs of building and highway construction are scarcely met by the increased tar recovery. Ammonia is used in the growing of crops, and still we lack enough. The oils obtained form a welcome addition to our limited supply of motor fuel, and the insistent odor of naphthalene again pervades our clothing and prevents the wanton moths' attack.

Gas for Traction Talked of at British Conference*

The report of the proceedings of the British Commercial Gas Association at the eighth annual meeting last week affords abundant testimony to the fact that this organization has realized that England has come out of the convalescent chamber and that we must now get back to every-day work. Public gas supply is a great national asset and those who arranged the proceedings of this conference know it. They not only know it, but it is obvious from the proceedings that they are determined that other people shall know it. The conference was distinctly a fighting one, fighting for the proper merits of gas to be recognized and proving the case for recognition up to the hilt. With a very large proportion of the matter which came before the meeting the industry is already thoroughly familiar. If the same measure of cognizance can be imparted to the outside public and to Parliament real progress will be made. It is doubtful whether, even yet, Lord Moulton's warning has been grasped, that before the country launches out into indiscriminate expenditure of capital, with the expectation of revolutionizing industry, proper consideration should be given to the possibilities of attaining the same end, or part of the same end, with the capital which has already been expended. No one wants to be hostile to electricity, but it would be traitorous to the gas industry and to the country to stand by while capital was being frittered away in supplanting in a less efficient way what gas is already doing and what it can do if given the proper measure of freedom.

Little has been said lately on the use of gas for traction. Lord Moulton brought it once again into review and exhorted a study of the report of the independent commission which recently dealt with this subject. Notwithstanding that the balloon-like gas reservoirs which did such excellent service during the period of oil shortage have disappeared in most places (they are still in regular use on the omnibuses serving the districts around Edinburgh), Lord Moulton is evidently a believer in gas for traction purposes being established with greater prospect of permanency. The quest for satisfactory means of storage under compression and the popularizing of the method should not be abandoned without a strenuous effort to secure a firm footing in the traction market.

Sir Dugald Clerk's lecture was largely a resume of his previous utterances on gas in its relation to coal conservation, but it is none the worse for that. The truths which he expounded are so important that no opportunity must be lost of putting them into the widest possible circulation. It is almost cause for thankfulness that there is really a shortage of coal, for with this fact pressing its attention upon the country no government outside a lunatic asylum can, except in ignorance, contribute its support to any scheme that will substitute the use of four tons of coal for the duty that is already done by one ton. It is the job of the British Commercial Gas Association and of the National Gas Council to see that the Government is not ignorant. Sir Dugald Clerk urges that the extension of the industrial stage of our civilization can only be made possible by the co-operation of the Government with the gas, steam, electric and hydraulic engineers. Officially the Government has been disposed only to "put its money" on the electric horse; but, if we mistake not, it is awakening to the fatuity of this partizan-like procedure and, with the country in the grips of a really serious financial situation, is less disposed to-day to risky speculation than it was twelve months ago.

*Reprinted from Report of Annual Conference in the Gas World, London, Eng.

Turning the Coal Shortage into Heater Sales

By ERNEST A. DENCH

Winter is here and the coal shortage is more serious than it appeared several months ago. This will mean that those householders who failed to obtain their full supply of coal will have to fall back upon other heating devices.

The gas company should step in at the psychological moment with a series of window trims devoted to gas heaters.

Gas Heater Display Methods

The Public Service Company of Newark, N. J., introduced a model fireplace in the center of their window, with a gas fire arranged in the grate. One's attention was next attracted by a gas radiator at each side, with a number of portable heaters at each furthermost corner. A carpet was laid on the floor. On top of the portable heaters a card advised:

"Just light this little portable gas heater to chase away the Morning and Evening Chill from the room in a jiffy."

The Lectrolier Store, of Brooklyn, N. Y., display their gas heaters on white enameled footstools. This little stunt serves to provide more classy surroundings to the appliances.

The Flatbush Gas Company, of Brooklyn, N. Y., have two entrances to their commodious showrooms. Outside the doorway of both, placed on a table, was a portable gas heater, lighted as in use. There were cards suspended from the lower part of the table calling attention to the merits of the heater. Standing outside one of the entrances a salesman was posted, and every little while he would deliver a convincing argument in a dignified way. There was a psychological reason in placing a heater in two far-away places with one of the places left unattended. Many people will pass by an exhibit if they think they are going to be pressed to buy, consequently this arrangement took care of both kinds of folks—the timid ones and those who do not consider salesmen as unnecessary nuisances.

During a portion of last winter Indianapolis had a very poor flow of natural gas that practically put some of the larger heaters out of commission. Many householders had the hunch that they were badly stung, so in order to keep their good-will the Citizens Gas Company offered to replace each such heater with another type that gave more heat with less gas. The charge for this service was $5 less than the cost of the heater. At the same time they discontinued the sale of all gas heaters that could not be effectively used during the gas shortage.

At the Model Homes Exposition, held in London, Eng., a gas heater booth was lined with chains of rose ribbon, with white cards on top. The arguments the cards put across were

Holidays Coming!
If you go away for a day or so to spend Thanksgiving or a week-end, we may be able to install a Gasco Furnace, remove your old furnace and have it all ready by your return, after which there will be
No more work,
No more dirt or dust,
No more ashes;
Just the joy of living!
But it is necessary that you plan ahead, as we are very busy installing gas heating-appliances in hundreds of Portland families.
Portland Gas & Coke Co.

PORTLAND GAS & COKE COMPANY, OF PORTLAND, ORE., ADVERTISING THE GASCO FURNACE IN THE DAILY NEWS.

ANOTHER ADVERTISEMENT OF THE GASCO FURNACE, PORTLAND GAS & COKE COMPANY, OF PORTLAND, ORE.

as follows and can be used in connection with most types of gas heaters:

"The Ninety per cent Efficiency Heater."

"Its own attendant."

"Lowest possible gas bill."

"Heats just as much as you need."

"Hot water always on tap."

"No useless storage needed."

Another booth was taken by the British Commercial Gas Association. The exhibit, set out on a table, was that of a model country home in minature. The model was minus all walls, doorways and windows in front, so that one could view all the interior at close range and notice the elaborate gas heating and lighting arrangement, which even extended to the attic.

The Gas Light & Coke Company, of Kensington, London, had a model bathroom window, with a bathtub built into the wall. There was a shower at the front side, with a wash basin at the rear. On the white tiled wall were two cards that conveyed the following information:

"Doctors and Patients alike realize the importance of hot water always being available. It may mean the death or life of the patient."

"The hot water for the bathroom is produced by apparatus capable of heating four baths an hour."

In another of their windows a card, surrounded by gas heaters, told that:

"Gas used carefully for heating is a success."

"A gas fire is a necessary comfort for all."

The Epsom District Gas Company, Epsom, Eng., accommodates those customers who do not wish to carry over a heater from one season to another, or to whom the purchase outright of a heater is too big an expense, by renting out the best types of gas heaters at the equivalent of one dollar for three months.

When heater sales are so easily made, it is human nature to sit back and wait for the people to come in. But this winter almost every gas company has profited by the experiences of previous winters. The result is that there will be more than enough heaters to go around. And when the supply is greater than the demand, that is the time for aggressive action in the form of advertising and attractive window displays.

Guy W. Talbot Undergoes Operation

Continued improvement in the condition of Guy W. Talbot, president of the Portland (Ore.) Gas & Coke Company, who was operated on at Chicago for the removal of his gall bladder, was announced in a message received at the offices of the company in Portland. The message came from George F. Nevins, of the company, who hastened to Chicago when word came that an operation was necessary.

The operation was performed at the Presbyterian Hospital, Chicago, after Mr. Talbot had for several weeks been under treatment at the Blackstone Hotel. During an Eastern trip he was seized with a recurrence of an old malady, and his condition became so critical that he was held for treatment.

Organization of Committee of Utility Stockholders Proposed

The organization of a committee of public utility holders of New York City has been proposed which is expected to interest the holders of gas company stocks. In the meantime the Consolidated Gas Company of New York suit before Special Master Gilbert to have the 80-cent gas law declared unconstitutional is pending, and the companies are hoping for early action that will allow them to charge more than 80 cents per 1,000 cu. ft.

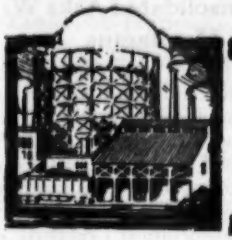
The Brooklyn Union Gas Company is barely earning a profit on the sale of gas at the 80-cent rate.

In the case of the Brooklyn Union Gas Company the percentage of operating expenses to gross earnings last year was nearly 94 per cent. Ten years ago, when the United States Supreme Court decided that the companies should determine whether or not they could get a fair return—say of 6 per cent—on their investment before the 80-cent law could be declared confiscatory, the operating expenses were 73.4 cents for each dollar of business. Steadily mounting expenses, particularly during the last two years, brought the operating expenses to 93.7 cents in the dollar, and during the past year that is said to have been exceeded.

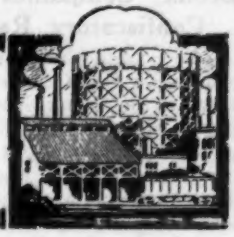
The following figures show the Brooklyn Union Company's gross revenues, operating expenses and net operating income during the past year, 1918:

Gross revenue	$13,053,798
Operating expense	12,228,194
Operating income	825,694

Officials of the gas companies of New York City believe that the showing of their earnings during the past year will be sufficient to convince the court that the price of gas to the consumer must be raised.



NEWS OF THE GAS INDUSTRY



Federal Fuel Administration May Prohibit Manufacture of Coke

Officials of the Peoples Gas Light & Coke Company of Chicago are somewhat disturbed over reports which have just come from Washington to the effect that the Federal Fuel Administration as a conservation measure will prohibit the manufacture of coke.

This presents a new problem, which grows out of the mine strike and the resulting shortage of soft coal.

The gas company's reserve supply of coke, which is indispensable in the making of gas, while normally sufficient to last sixty days or more, has been reduced to a supply of but forty days, according to Samuel Insull, president of the company.

While it would be possible to substitute anthracite coal for coke in the manufacture, a 25 per cent reduction in efficiency would be inevitable.

"While the public does not fully realize the danger of a fuel famine, the situation is very serious," said Mr. Insull. "The man who takes the position that the country is unnecessarily alarmed and creates the impression that there is an ample coal supply is pursuing a course that is absolutely contrary to public interest.

"The coke supply now on hand is sufficient to carry the gas company well into January, and company officials are not inclined to believe it will be necessary to resort to the use of substitutes for coke in the manufacture of heating and cooking gas. They are preparing, however, to handle the situation should it arise."

Muskegon Gas Company Selling Its $100 Bonds for $85

The Muskegon Heights Gas Company of Grand Rapids, Mich., was ordered by the Public Utilities Commission to sell its bonds at 85 per cent of the par value of the stock. The company is geting out a $65,000 stock issue, and asked the commission for a price to be placed upon the bonds for the sale. The $100 bonds will be sold for $85.

President Slocum of New Jersey P. S. C. Answers Newark's Rate Protest

An answer to the protest of the Newark Board of Public Utility Commissioners against the rise in gas rates allowed in that city was made public by John W. Slocum, president of the New Jersey State Board of Public Utility Commissioners. President Slocum said that his board had no authority to require a gas company to furnish gas at a rate that was unreasonably low.

He advised the Newark Commissioners to read the findings of the State Board in its hearings on the gas rate, and then to take legal action if they still thought the rate "unjust, unreasonable and exorbitant." It was his contention that it was unreasonable to require the company, in view of increased operating cost, to continue furnishing gas at 90 cents, the rate fixed in 1912.

Illinois Gas Association Planing Second Annual Exhibit

The Illinois Gas Association is now shaping its plans for the second annual exhibit, which it will hold, in connection with the convention, March 17 and 18, 1920, at the Hotel Sherman in Chicago.

H. H. Clark is chairman of the exhibit committee. Mr. Clark is already sending out contract blanks for exhibit space and requests prompt action on the part of gas companies and manufacturers in reserving space. Reservations will be made in the order in which the applications are received. The booths will be ready for exhibitors at 8 a. m. on March 16, and all display must be in place before the exhibit opens at 10 a. m. on March 17.

Oklahoma Makes Effort to Conserve Gas for Industrial Use in Coal Shortage

The Oklahoma Natural Gas Company's connection with the Walters field is completed and gas from the new territory is available for distribution, it was announced by Campbell Russell, corporation commissioner. Connection with this field is expected to improve greatly gas service in Oklahoma City and in all other towns and cities served by the company.

In announcing this Mr. Russell also gave out a statement defining the attitude of the commission on the distribution of gas during the impending coal famine as follows:

"Under the ruling of the corporation commission domestic consumers will continue, as heretofore, to have first call on gas supply; but during the fuel shortage all industrial gas possible will be furnished—industries that are of most general concern to the public to be supplied first.

"Domestic consumers are urged to use the minimum amount of gas that will provide for their comfort and health, in order that the largest possible supply may be available for operating necessary industries.

"The line to the Walters field is completed and well connections are now made. All gas companies are urged to have available the largest amount of gas which, under the law, they are allowed to draw from the wells, up to the full capacity of their line, and it is the hope of the commission that much more industrial gas can be provided during the coal shortage than has heretofore been available; but the commission will not approve or permit the unnecessary use of gas at this time. The use of gas by electric companies for manufacturing electricity for display advertising, or other non-essentials, is forbidden."

ALBERT L. BROWN has been appointed superintendent of Worcester Gas Light Company.

Bronx Companies Join in Confiscatory Rate Case

The Central Union and the Northern Union Gas Companies, both located in the Bronx, New York, have begun suits in the Federal Court to have the 80-cent gas law declared confiscatory and unconstitutional. The complaints are identical and follow the phrasing of a similar suit brought by the Consolidated Gas Company of New York which is now being heard by a referee.

According to the complaints the two companies serve an aggregate of 179,000 consumers. The Central Union Company states that its property, devoted to the gas business, was valued at $11,594,146.29 in 1918, that it lost 32.53 cents per 1,000 cu. ft., representing a daily loss because of the statutory rate, of $2,489.78. The company also alleges that its earnings below 7 per cent on the minimum valuation of its investment amount to $1,024,660.92.

Figures contained in the complaint of the Northern Union Company are to the effect that its plant was valued at $4,733,323 in 1918, and that its daily loss was $1,564.32. Pending the trials of the actions the complainants ask for injunctions restraining the defendants from attempting to enforce the law. The defendants named are the Attorney General, the District Attorney of the Bronx, and the Public Service Commission.

Fire Completely Destroys Gas Plant

The plant of the Citizens' Gas Company at Carroll, Iowa, was destroyed by fire on Nov. 14. The cause so far is not known. The loss was complete.

A Gas Plant for Thomaston, Conn., Sought

The Thomaston (Conn.) Business Men's Association has appointed Henry E. Stoughton, Mark C. Guernsey and E. A. Bradley a committee to interview the Stone & Webster Company with a view to obtaining a gas supply for the city of Thomaston. The committee will also investigate the cost of establishing and maintaining a gas plant here and report at a meeting to be held later. An effort will be made to induce a Waterbury or Bristol, Conn., concern to lay pipes to Thomaston if the committee reports favorably on the matter.

Illinois Committee Says Gas Companies Have Shouldered Heavy End, Relying on Increased Operating Efficiency

A report of the Illinois Public Utilities Commission states that the reason gas companies of Illinois were compelled to ask for higher rates, after struggling with the burden of rapidly mounting costs of production during the war period, is very plain when the figures on file at the Illinois Public Utilities Commission at Chicago are studied for a moment.

"The figures," says the Committee on Information, "show that while there were big increases in costs of all products entering into utility service prior to 1918, the companies 'sat tight' and tried to shoulder the entire burden."

It is pointed out that it was the extra toll exacted in the way of costs since 1917 that was the compelling factor in necessitating increases in rates if efficient service were to continue.

A comparison of the cost of some important items entering into gas making, based on their economical use in large quantities and figured on the basis of cents per 1,000 cu. ft. produced, best tells the story. It follows:

	1917.	1919.
Steam fuel	1.78	3.07
Coke	6.01	16.68
Purifying material—		
oxide	0.17	0.38
Works supplies	0.53	0.97
Production labor	3.99	6.66
Production material ..	1.18	1.74

A comparison of these six items alone shows an increase of 120 per cent. Comparing present rates with the increased costs shows that consumers have not been asked to shoulder their full proportionate burden on the higher production prices, according to the committee.

"The companies have taken the heavy end hoping to overcome it by increased efficiency in operation."

10,000,000 Ft. Gasser Completed at Bull Bayou

The Boone Oil Company, of Shreveport, La., has brought in its Giaque No. 1 in section 8-11-11, Bull Bayou field, three miles south of previous production, as a big gasser good for 10,000,000 cu. ft. The gas was encountered at about 2,657 ft.

Boston Consolidated Asks Writ of Mandamus

A petition has been filed in the Supreme Court by the Boston Consolidated Gas Company for a writ of mandamus to compel the Massachusetts Board of Gas Light Commissioners to approve a contract entered into with the New England Fuel & Transportation Company of Everett, Mass.

The Boston Consolidated Company claims on Sept. 27, 1917, it made a contract in which the fuel company agreed to furnish daily 5,000,000 cu. ft. of gas at 29½ cents per 1,000 cu. ft. This contract, the petitioners say, was approved by the gas light commissioners Dec. 10, 1917. On Dec. 11, 1918, the gas company rescinded the contract and entered into a new one with the fuel concern, agreeing to pay 35 cents per 1,000 cu. ft.

The gas company alleges the gas commissioners agreed the price named in the contract was less than it could be manufactured for by the fuel company. Alonzo R. Weed, chairman of the Massachusetts Board of Commissioners, voted to approve the contract, while the other members of the board, Gen. Morris Schaff and Solomon Lewenberg, did not, the petitioners claim.

Woonsocket Employees' Club Hears Lecture on Government Ownership

The members of the Woonsocket (R. I.) Gas & Electric Employees' Club held their first supper of the season on Nov. 15.

The supper was followed by a short business meeting, after which F. R. C. Gordon, a lecturer of national reputation on the economic situation of the present day, spoke on "Individual vs. Government Ownership." Mr. Gordon presented his statements in a forceful manner, and proved to his audience without any question of doubt, by data and statistics, that Government or municipal ownership of railroads, telephone and telegraph companies, public utilities, etc., had not proven satisfactory, and were not practical from an economic standpoint.

Messrs. Pettengill, Conley, Wheelock and Corbett, chairman of the educational, entertainment, sports and house committees respectively, outlined very interesting and attractive programs for the club for the coming season.

Washington, D. C., Co. Asks Increase of Deposits for Main Extensions

A petition has been filed with the Public Utilities Commission by the Washington, D. C., & Georgetown Gas Light Company asking for permission to increase the amount of deposits for extension of gas mains and gas service throughout the city.

The present regulations provide that the company extend their service for 125 ft. free, and for every foot thereafter the consumer shall deposit 75 cents. The company wants this amount increased to $1.75 and $2.

The company says that the increased cost of labor and material necessitates the company making this request. In the present rules the commission designates 75 cents a foot as the cost, regardless of whether a four- or six-inch pipe is installed by the company. The petition asks that the charge for a four-inch pipe installation be $1.75 a foot and a six-inch pipe $2 a foot. The size of the pipe depends entirely upon the amount of gas the consumer contemplates using.

All deposits for installation of gas mains are returned proportionately by the company as the use of gas in the neighborhood increases.

Industrial Department's Gains for One Week's New Business of 6,808,500 Cu. Ft. Monthly

Receives Order from Casting Company After Three Years' Unceasing Effort

A number of new large accounts for supplying gas have just been entered into by the Peoples Gas Light & Coke Company of Chicago.

The Doehler Die Casting Company of Brooklyn and Toledo are at present erecting a new building in Chicago. The company has a high pressure main in front of this building and will be enabled to supply the 15,000 cu. ft. of gas per hour which it is estimated the plant will use in the near future.

An order has also just been taken to equip the Twenty-sixth Street foundry of the National Malleable Casting Company.

"This was particularly gratifying," said the company officials, "as the first order to equip the foundry was received in September, after about three years of unceasing effort. It is indeed pleasing after convincing a firm that they should use 1,500,000 cu. ft. of gas per month to have them tell you that you were slightly mistaken and to receive an order which forces you to double it."

An order has been received from Hart, Schaffner & Marx Company, which will mean an approximate consumption of 750,000 cu. ft. of gas per month at each of the new shops which the firm is about to open in Chicago.

Accounts for consumption of 500,000 and 700,000 cu. ft. of gas per month at the plants of the Chicago Journal Company and the H. G. Saal Company also have been obtained.

"The effort of the Industrial Department as a whole for the week ending Nov. 21 resulted in the addition of consumers whose total consumption will average 6,808,500 cu. ft. per month," the company announced.

When You Entertain
in the evening, the magic of the New Illumination makes itself appreciated!
Instead of glare, there's a restful radiance; instead of nervous brilliancy, a soothing relaxing cheerfulness; instead of sharp lights and dark shadows, a soft diffusion of light, most becoming to the complexions of the ladies, and comforting to the eyes of all.
What is the New Illumination?
Its other name is Semi-Indirect Lighting, and it is based on a wonderful idea of diffusing part of the light-rays through a softly translucent bowl, and reflecting the other part indirectly from the ceiling.
Semi-Indirect Lighting is the lighting of the hour. All over the country it is sweeping into popularity because of its new and unusual advantages. In line with this movement, we have selected the most beautiful lighting fixture we could find—this
Weisbach Semi-Indirect Fixture
and we are conducting a great demonstration and educational campaign to introduce it into the homes of this city.
The illustration shows it—a modern fixture of the best type—artistic in color and design, correct in lighting principle, mechanically perfect, and giving the powerful, plentiful, semi-indirect illumination that you can get only with gas. We are demonstrating this fixture in our salesrooms, but that is not enough.
You should see it in your own home, if you are to realize fully what it will do for you—what a tremendous improvement it will make in the lighting and the decoration.
See It In Your Home at Our Expense
During this demonstration we will install this fixture in your home entirely without cost or obligation to you. After three days, if you do not wish to keep it, the fixture will be removed as cheerfully and courteously as it was installed, and your original fixture replaced.
If you wish to purchase, the price is: $2.00 per month with and in addition to your next eleven gas bills. Total, $22.00.
You Pay Nothing Down
A card or 'phone call will bring one of our representatives. He will further explain the idea of Semi-Indirect Lighting, and answer any questions you may have. No obligation incurred—not even the three days' trial unless you want it. This is a new lighting idea; we want to give you every opportunity to become acquainted with it.
AT YOUR SERVICE
Salesrooms 62-64 Weybosset St.
PROVIDENCE GAS CO.
Salesrooms 62-64 Weybosset St
ONE OF THE PROVIDENCE COMPANY'S LIGHTING ADVERTISEMENTS APPEARING IN THE DAILY PRESS

Court Ruling Allows Opening of Carbon Black Manufacturing Plant

Wyoming's law prohibiting the manufacture of carbon black from natural gas within ten miles of an incorporated town was held unconstitutional in a decision to-day.

The decision was in injunction proceedings brought by the Midland Carbon Company, which has a $1,500,000 plant in Big Horn County, and the Occidental Oil & Gas Company. The law was passed to conserve the natural gas supply for use in lighting and heating cities.

Judge Walter H. Sanborn, of St. Paul, Minn., of the United States Circuit Court of Appeals; Judge W. H. Munger, of the United States District Court at Omaha, Nebr., and Judge John A. Riner, of the United States District Court at Cheyenne, Wyo., rendered the decision.

Clarksburg Company Granted Increase to Industrial Consumers

An order has been issued by the Public Service Commission of West Virginia granting increased rates to the Clarksburg Light & Heat Company, of Clarksburg, W. Va., in its charges to industrial consumers. The order states that petition was filed by the consumers giving assent to the increase, which permits a charge of 27 cents a 1,000 cu. ft. until Jan. 1, when the charge will be 28 cents. One cent discount is allowed for prompt payment.

Massachusetts Gas Companies' Earnings

The combined net earnings available for dividends of the subsidiary companies of the Massachusetts Gas Company for October showed a decrease of $45,768. A comparative statement of earnings follow:

	1919.	1918.	1917.
Boston Consolidated Gas	$75,889	143,842	106,500
East Boston Gas	923	2,866	4,449
Citizens Gas Light	5,155	10,774	4,296
Newton & Water Gas Light	7,660	5,304	10,648
Totals	89,628	162,788	125,894
New England Fuel & Transportation	204,139	198,607	329,593
New England Coal & Coke	45,799	23,939	8,506
Totals	249,938	222,547	338,099
Grand totals	339,597	385,335	463,994

Another Strong Flow Encountered at Second Depth of 1700 Feet

The Mitchell Production Company is now down about 1,700 ft. in the Brewer gasser, near Dallas, Texas. This well was drilled 1,640 ft. some months since, when about 30,000,000 ft. of gas was struck. Since that time, till a short time ago, the well has been used for fuel. A resumption of drilling in the well took place recently and at a depth of 1,700 ft. another strong flow of gas was encountered, estimated at 15,000,000 ft.

Another Old Gas Well Makes Good

Another gas well drilled 30 years ago, and recently cleaned, has given indications of sufficient pressure for utilization. The well is located on the property of John C. Bolinger, in Fremont, Ohio.

This is the second old well after treatment in Fremont that has been made into a good producer again.

Municipalities League Seeking State Legislation Governing All Utilities

The League of Texas Municipalities is endeavoring to secure the passage of a law which will govern the service of all public utilities in Texas.

At present the Lone Star Gas Company, operating in Texas, is not operating under any laws in Texas which govern its action in reference to the service to be rendered.

The Dallas, Tex., City Attorney, Collins, states that the Lone Star Gas Company was not in any way governed in its operations by laws of the State of Texas or by interstate regulations, but that it is, however, the only utility serving the public of the State which was not governed by some law of regulation.

South American Operating Activities for Gas of Emerald Oil Company

Preparations have been completed for sending to the South American State of Colombia, early in December, a geological corps for the Emerald Oil Company, to make a survey of the immense tract of land recently leased in the Department of Bolivar for oil and gas development. The geological expedition will be followed, shortly, by an operating party.

Jerome B. Burnett, geologist, will head the geological party with S. Sanchez as assistant. A launch has been purchased in which the party will ascend the Rio Magdalena to the leased lands which are known as the Lands of Loba.

There are many streams upon the Lands of Loba, which compose 1,500,000 acres. The launch will be used so that a quick survey can be made of a large part of the tract in a short time.

The operating party will follow the geological party about the first of the year. Preparations will be made for drilling locations and the further development of the property.

The Emerald Oil Company, of which Alfred J. Diescher is president, acquired the tremendous prospective oil and gas leases in Colombia recently from the American-Colombia Corporation of Utah. It is easily reached by two navigable streams. The Emerald Oil Company, whose headquarters are in Winfield, expect to begin drilling immediately succeeding the close of geological and operation expeditions.

Another Well Brought In in Crawford County Field

The second big gasser to be brought in the Crawford County field in Arkansas was brought in on the Crawford County bank lease by the Crowe Oil & Gas Company to-day. Recently drillers and company officials said the test was good for at least 1,000,000 ft. of gas and the producing sand had not yet run out. They predicted a well that, when shut in, would be at least good for 20,000,000 ft. This is the second well the Crowe Company, discoverer of the Williams field, has on this lease. The first well made 12,000,000 ft. The second well is south of the first well.

Committee Appointed to Investigate Situation in Wichita

George Hamilton, president of the Board of Commerce, of Wichita, Kans., has been authorized by the director of that organization to appoint a committee to investigate the gas situation in Wichita, Kans. How to get gas into Wichita at a lower rate and at the same time have a continuous supply will be part of the work to be reported on by the committee.

Coal Strike Stimulates Output of Beehive Coke

The coal strike continued to stimulate rather than restrict the output of beehive coke. Production during the week ended Nov. 22 was 424,000 net tons, the highest mark attained since last May, with the exception of the first three weeks of September immediately preceding the steel strike. As will be seen from the accompanying table all districts except West Virginia reported an increase.

ESTIMATED PRODUCTION OF BEEHIVE COKE (Net Tons)

	Week Ended Nov. 22, 1919	Week Ended Nov. 15, 1919	Week Ended Nov. 23, 1918	1919 to Date	1918 to Date
Pennsylvania and Ohio	318,576	307,813	380,766	13,186,804	19,632,422
West Virginia	17,247	18,152	36,457	952,544	2,270,906
Alabama, Tenn. and Georgia	42,599	32,995	43,778	1,512,021	2,241,927
Virginia and Kentucky	28,582	25,124	28,100	1,074,196	1,460,533
Colorado, Okla. and N. Mex.	12,633	11,568	19,785	521,033	1,424,393
Washington and Utah	4,823	4,127	11,987	249,797	597,016
United States total	424,460	399,779	520,873	17,496,395	27,627,197
Daily average	70,743	66,630	86,812	62,937	99,378

The reasons for this greater production of beehive coke are not far to seek. The ovens for the most part lie in non-union fields, which have been but little affected by the strike. The closing down of union mines has left an abundance of open-top car equipment for those mines remaining at work. Restrictions on the release of coal have applied to by-product coke makers as well as to other industrials, and the demand for beehive coke has no doubt thereby been intensified. The fact that the war-time maximum prices have been restored upon coal, but not upon coke, has placed a premium upon the conversion of coal into coke at the mines.

Active Demand in Anthracite Industry

The anthracite industry responded to the stimulus of active demand caused by the soft coal strike with the largest production of the year. The week's output is estimated at 2,018,000 net tons, an increase over the week before of 192,000 tons, or 10.5 per cent. The highest rate of production ever maintained by the anthracite mines for an extended period was during the summer of 1918 when war-time demand for the steam sizes of anthracite carried the output to an average of 2,080,000 tons for a full-time week. The fact that the mines are now producing within 60,000 tons of that maximum indicates that but little more can be expected of them to fill the deficit caused by the bituminous strike.

ESTIMATED UNITED STATES PRODUCTION OF ANTHRACITE (Net Tons)

	1919 Week	1919 Coal Year to Date	1918 Week	1918 Coal Year to Date
Nov. 15	1,826,000	57,809,000	1,405,000	63,581,000
Nov. 22	2,018,000	59,827,000	1,778,000	65,358,000

Indiana Fuel & Light Company Rates Increased

The Indiana Fuel & Light Company was authorized by the Public Service Commission of Indiana to establish a new schedule of gas rates at Kendallville, Auburn and Garrett, Ind. The primary rate for the first 10,000 cu. ft. was increased from $1.40 net to $1.65 net on 1,000 cu. ft.

Daily Production Increased to 40,000,000 cu. ft.

The Gulf Refining Company's No. 1 gas well on the Moore tract in Stephens County, Texas, is making 40,000,000 cu. ft. of gas at a depth of 2,000 ft.

New Gas Well Struck in Desdemona Field

The Southern California Drilling Company brought in a gasser, estimated to be making 40,000,000 cu. ft., on the Shellenberger tract, about two miles north of Desdemona, Texas. This gas was found at a depth of 2,830 ft., about 100 ft. deeper than the Duke sand, and is considered proof that there is a second sand in the Desdemona field.

25,000,000 cu. ft. at 2,045 ft. Depth

The well six miles northwest of Granbury, Texas, on the Cogdell-Whitten ranch picked up fifteen ft. of hard gray gas sand at 2,030 ft. to 2,045 ft., producing about 25,000,000 cu. ft. of dry gas.

Old Gas Wells Can Be Made to Produce

Clyde Cummins, of Middletown, Ind,. has been cleaning gas wells in the vicinity of northwest of Daleville, Ind. Mr. Cummins says that all the wells which he has cleaned lately in this and other sections show a much better pressure than they did a few years ago. He also states that he believes, with the proper care, old gas wells can be made to produce more gas than they have for several years.

New Meter Legislation Proposed

A special bill regarding meters is being prepared for introduction in the coming session of the New Jersey State Legislature. The bill will contain the proposition that every meter used for recording use of gas, electricity or water shall be turned back to zero each time a reading is made by the representative of the public service company.

82 Prizes Awarded to Employees for Suggestions for Rendering Better Public Service

The Peoples Company of Chicago uses many means to develop creative ability among its employees and offers every incentive for its men and women employees to make suggestions for the rendering of better public service. One of the company's latest moves along this line has been the awarding of prizes annually for suggestions—any suggestions that will be of aid in developing efficiency.

During this first year of the new plan, which has just ended, 210 suggestions were submitted. It is especially interesting to note that 81 of these were accepted. A prize was awarded and the one making the suggestion became eligible for the big prizes at the end of the year.

The first prize went to John J. Connors who devised a quick action wrench for use on valves in manholes, which was described in the AMERICAN GAS ENGINEERING JOURNAL. It is a most important and valuable device. It not only facilitates the work, but also removes the element of danger which is generally more or less present in this class of work. The other prize winners offered suggestions covering a wide range, from short-cuts in bookkeeping to placing guards at walkways where repairing is being done.

C. H. Quackenbush Requested to Advise with Mine Owners

With a roar heard for a mile and accompanied by a pressure which threw rocks and dirt over workman, a flow of natural gas burst last week into the new coal mine being sunk at Moro, north of Edwardsville, Ill., by the Moro Coal & Mining Company, which company owns and operates a mine west of Moro, Ill. The new shaft is a quarter of a mile north of the town. For a week the workmen have been encountering brush and trunks of trees more than 90 feet underground. The shaft had reached a depth of 100 ft. when the explosion occurred. The men, somewhat stunned, were hauled to the top. The company now is casting about for a method of controlling the gas. C. H. Quackenbush, general manager of the St. Clair County Gas & Electric Company, has been asked to advise with the mine owners.

Construction Notes

Henrico Plant Sold — New Mains Will Be Laid

The Board of Aldermen of the city of Richmond, Va., have adopted the appropriation of $175,000 for the purchase of the distribution system of the Henrico County Gas Company, which supplies several of the northern suburbs of Richmond, in which the supply of gas has been inadequate for the past several months. It is expected that it will take some months to lay the proper supply mains to connect this distribution system with the gas works in Richmond. Meanwhile Director of Public Utilities Trafford is authorized to lease and operate the gas-making plant of the Henrico company until these connections can be made.

Gas Machinery Company Installing Tar Washer and Tar Extractor of One Million Ft. Capacity

The Gas Machinery Company of Cleveland, Ohio, recently installed a water gas set in the gas department of the City of Norwich, Conn., and rebuilt old apparatus for the department, and is now installing a water gas tar washer and a water gas P. & A. tar extractor of about 1,000,000 cu. ft. daily capacity in connection with a new exhauster, by-pass valves and connections and auxiliary equipment. All of this machinery is being installed in the department's old coal gas apparatus room.

New Plant Under Way for Completion in Spring

The first shipment of material for the rebuilding of the North Alabama Gas Company's plant, in Florence, Ala., has arrived and is being installed. A plant capable of caring for a city of 100,000 people is to be built. It is thought that it will be ready for service by next spring.

Gadsden Works Install Booster

At the gas works in Gadsden, Ala., a booster has been installed for the purpose of securing uniform high pressure. The system in Gadsden, Ala., has needed this improvement for several years.

McKinney Gas Company Will Make $40,000 Improvements

Improvements are under way at the McKinney Ice & Coal Company plant in McKinney, Texas. A new addition which will double the capacity of the plant will be made. The company plans to expend $40,000.

The North Texas Gas Company will extend its mains in East McKinney to connect with a main on Wilcox Street. President S. B. McKinney was here from Dallas and conferred with Local Manager W. W. Simpson.

Penobscot Company May Build New Gas Plant

Penobscot Bay Electric Company has announced that it will not discontinue its gas plant in Belfast, Me., but will either rebuild or greatly improve the present one, giving much better service.

The company threatened to do away with the plant entirely, thus throwing out all the gas ranges, on which a large number of patrons depend and which would compel the installation of electric ranges. The gas plant is over 50 years old and sadly in need of repairs.

The Penobscot Bay Company is a subsidiary of the Central Maine Power Company and was formerly the Belfast Gas & Electric Company.

Contra Costa Company Plans Artistic Layout for New Buildings

Plans and specifications have been accepted by the Contra Costa Gas Company of Martinez, Cal., for the buildings which are to be constructed on their property. The plans call for a modern bungalow which will be occupied by the resident manager of the company and several other buildings which are required. The company will also build a large gas storage tank on the property which will hold a sufficient supply of gas to supply Martinez, Cal., and the other towns along the waterfront in the event of a break in the system between here and Pittsburg, Cal.

It is the plan of the company to make the site an artistic addition to that part of the city. The grounds will be surrounded by trees and the gas plant concealed from view as far as possible by shrubbery. The plans for the buildings are being prepared by W. A. Doctor.